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Article

Publications in the proceedings of ABPMC (Brazilian Association of Psychology and Behavioral Medicine) from 2002 to 2012 about distance education analyzed under the behavior analysis optics

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ABSTRACT

Over the years, behavior analysts have been concerned to propose new teaching technologies. Depending on the current proposals for distance education, the present study aimed to analyze the contributions of behavior analysts for the modality of distance education (e-learning). For this, a review of the proceedings of workshops sponsored by ABPMC – Brazilian Association of Psychology and Behavioral Medicine – was performed from 2002 to 2012. The articles should attend to two criteria on distance learning, considered by Decree number 5.622 (BRAZIL, 2005): 1) to have mediation between teacher and student through information and communication technologies, and 2) to provide different locations and/or time to make the activities performed by teacher and student. The results showed that, despite increasing use of distance education in our country, behavior analysts have not been publishing significantly about the subject in the proceedings of the largest meeting of professionals from this field in Brazil. Only twelve articles that attend to the established criteria were published over the last ten years, which were the the focus of this study, and they were classified by different analysis categories in this article.

Key words: Distance education. Behavior Analysis. B. F Skinner. Fred Keller. ABPMC.

RESUMEN

Con los años, los analistas del comportamiento se han preocupado de proponer nuevas tecnologías de enseñanza. Debido a la puntualidad de las propuestas de educación a distancia, el presente estudio tuvo como objetivo analizar las contribuciones de los analistas del comportamiento de la modalidad de educación a distancia (EaD). Para ello, se realizó una revisión de las actas de las reuniones organizadas por ABPMC – Asociación Brasileña de Psicología y Medicina Conductual – desde 2002 hasta 2012. Los trabajos deben cumplir con dos criterios de educación a distancia, considerados por el Decreto Nº 5622 (BRASIL, 2005): 1) haber mediación entre profesor y alumno a través de las tecnologías de información y comunicación y 2) los lugares y/o tiempos diferentes para el desarrollo de las actividades del profesor

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y el alumno. Los resultados mostraron que, a pesar de la creciente utilización de la educación a distancia en nuestro país, los analistas del comportamiento no han publicado expresivamente sobre el tema en los anales de la mayor reunión de profesionales en esta área en Brasil. Sólo doce artículos fueron publicados en los diez años del estudio que cumplan con los criterios establecidos, y que fueron clasificados por diferentes categorías de análisis en este artículo.

Palabras clave: Educación a distancia. Análisis de Comportamiento. B. F. Skinner. Fred Keller. ABPMC .

RESUMO

Ao longo dos anos, analistas do comportamento têm-se preocupado em propor novas tecnologias de ensino. Em função da atualidade das propostas de educação a distância, a presente pesquisa teve por objetivo analisar as contribuições dos analistas do comportamento para a modalidade da educação a distância (EaD). Para tanto, foi realizada uma revisão dos anais dos encontros promovidos pela ABPMC – Associação Brasileira de Psicologia e Medicina Comportamental – no período de 2002 a 2012. Os trabalhos deveriam atender a dois critérios sobre educação a distância, considerados pelo Decreto de nº 5.622 (BRASIL, 2005): 1) haver mediação entre professor e aluno por meio de tecnologias de informação e comunicação e 2) lugares e/ou tempos diversos para o desenvolvimento das atividades realizadas por professor e aluno. Os resultados demonstraram que, apesar do crescente aumento da utilização da EaD em nosso país, os analistas do comportamento não têm publicado expresivamente sobre o tema nos anais do maior encontro de profissionais dessa área no Brasil. Apenas doze artigos foram publicados nos dez anos do referido estudo que atendem aos critérios estabelecidos, sendo que os mesmos foram classificados por diversas categorias de análise no presente artigo.

Palavras-chave: Educação a distância. Análise do Comportamento. B. F. Skinner. Fred Keller. ABPMC.

INTRODUCTION

The legal basis of distance education in Brazil is established by the Law of Guidelines and Bases of National Education (LDB / Law 9.394, from December 20, 1996), which states in article 80:

the Government will encourage the development and broadcasting of distance educational programs, for all levels and modalities of education and continuing education (Brazil, 1996, p. 25).

Decree 5622, published on December 20th, 2005, regulates the article 80 of LDB and brings in article 1 a definition of distance education characteristics as an

educational modality in which the didactic and pedagogical mediation in teaching and learning processes occur with the use of media and information and communication technologies, with students and teachers developing educational activities in diverse places or times (Brazil, 2005).

In addition, the

emphasis on learner autonomy, exploration of course books possibilities,mastery of tools and prior knowledge of interaction and mediation processes and availability and interest for differentiated communication of information sources

should be part of teaching in virtual environments to encompass the procedures and resources of the technological tools (ABED, 2012, p. 51).

However, despite the legal basis of distance education have been established in

1996, this modality of education was already being practiced in Brazil and in the world long before. In Brazil, in the 70's, the distance made use of television as technological means for transmitting information; in the 80's, recording video and audio have joined this type of education, and digital technologies, especially *the* Internet, started to contribute as a technological tool for the distance education from the 90's (VIANNEY, 2000).

It is important to note that throughout this historical process, distance education systems were being modernized and are currently considered high complexity, often higher than the actual education, especially by the fact that its structure demand multiple elements and determine the form of occurrence of their relations and internal learning processes (JESUS; BORGES, 2014).

Among the various Skinner's contributions to behavior analysis, education has always been one of his central concerns. Besides the book "Technology of Teaching" originally published in 1968, Skinner published 25 articles or chapters in books talking about education. This finding shows that behavior analysis concerning about education is not new.

Understanding education for Skinner is that "education is the establishment of behavior that are beneficial to the individual and to others at some future time" (SKINNER, 1968/1972, p. 226). For the same thinker, the concept of education is different from the concept of teaching, besides teaching is "to have reinforcement contingencies under which the behavior changes" (SKINNER, 1968/1972[4], p. 108). And having these contingencies is not only the teacher's task but also the student's and all other actors' involved in this process.

Clearly, in the 60's, Skinner (1968/1972) did not speak of the distance education methods we have today, but he emphasized that the

use of technological resources in education can not simply intended to present the material, making student a mere "statement of passive receptacle" (1968/1972, p. 27), but rather should encourage the student to the knowledge. For the author, it's useless to provide the student with a range of materials, equipment and technology, without planning contingencies that will not interfere on the the achievement of expected behavior; so, he proposes what it is called Programmed Instruction.

As its name implies, Programmed Instruction is one of the teaching strategies which consists of a carefully ordered and organized chain of contingencies, in order to ensure learning conditions to the student. Originated in 1953, Programmed Instruction started from the development of an equipment, called "teaching machines", that promoted individualized study (SKINNER, 1968/1972). The implementation of teaching machines, highlighted by Araujo (2008), can be considered something precursor of distance education.

Among the advantages of so-called teaching machines, Skinner (1968/1972) highlights aspects such as: (1) immediate consequences to student responses; (2) respect for the individual paced; (3) active participation of the student in the teaching-learning process; (4) planned sequence of steps of the material, allowing the modeling of behavior.

Contemporary Skinner, Keller (1968) proposes another individualized teaching method as an alternative to educational problems. Called Custom Teaching System (CTS), the method based on the proposal for Programmed Instruction, is premised on individualized and personalized instruction, respecting the rhythm of each student. The system allows students to follow their own pace, including meeting the objectives of each unit. But to continue the process, passing the most advanced units, the student must have obtained full control of the content treated

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[4] A primeira data faz referência à edição original e a segunda à data da edição consultada.

in previous units. The method also stresses the importance of the teacher or monitor, since there is active participation also monitors or tutors to aid in the study. The teaching material also deserves attention in the learning process.

A Virtual Learning Environment (VLE) has several tools that enable from the group people work in order to promote learning through discussion, reflection and decision-making, such as content management, user management, communication, collaboration, evaluation, usage statistics and administration. Planning options for the contingencies that control learning behavior from the Programmed Instruction, suggested by Skinner (1968/1972), and the CTS, suggested by Keller (1968), are also found in Virtual Learning Environments.

The contributions of behavior analysis in order to understand the teacher-student relationship that is used in distance education can be verified in studies of Araújo (2008) and Couto (2009), who used a call learning technology CAPSI (Computer Aided Personalized System of Instruction). This technology began to be used in Canada in 1983 (KINSNER; PEAR, 1988) and is based on the fundamentals of Custom Teaching System (CTS) proposed by Keller. In CAPSI system, the units of study are divided into parts; the student can follow your own pace of work and only passes to the next unit if you have managed to achieve excellence. Testing of each unit of study and examinations are provided by the system, which records everything that is considered relevant from what has been accomplished by teachers and students, as activities, corrections, messages, notes, etc. In general, both studies indicated that CAPSI proved to be an effective system of education and teaching (as concepts proposed by Skinner 1968/1972) due to the high notes of graduating students and good reviews that made the discipline.

Another study has investigated the behavior analysis of contributions to the distance education, but in a different perspective, was Nascimento's study (2013). The study aimed to characterize the production of behavior analysts on distance through a review of articles published in the Journal of Applied Behavior Analysis (JABA) in the period from 1968 to 2012. The search for articles was based on 22 Keywords previously established by the researcher, and the inclusion of articles in the study had as a requirement that met the two specific criteria on the distance education: 1) there is didactic and pedagogical mediation by the use of media and information and communication technologies; 2) teachers and students to develop activities in different places or times. The variables and their categories include participants setting, studies the goals, target behavior, technology used, procedures and results. A search through key words revealed 73 articles, of which only 15 met the criteria and were considered research in distance education. Overall, Nascimento (2013) concludes that the behavior analysis of contributions to the distance there are few, considering the low number of publications in the journal JABA with this theme.

The application of the knowledge produced by Behavior Analysis for distance education proves to be relevant, especially because much of what is recommended by behavior analysts in terms of programming and individualization of teaching matches the distance education. Fernandes Ribeiro (2014) sought from the investigation of a teaching method used in a course offered at a distance in a campus undergraduate course, examine how the principles established by Skinner in the late 60's, and studied today by analysts behavior could contribute to distance education.

The results show that when considering the application of the principles proposed by Skinner, about half a century in a teaching method used in a course offered at a distance in a campus undergraduate course, highlights

the usefulness and the relevance of these principles for the planning of teaching and they really can be used effectively in this type of education. For the author,

> the closeness of the distance with the technological resources commonly used in this type contribute to the implementation of what Skinner conceived in the late 60 (RIBEIRO, 2014, p. 147).

According to Census 2011, there was an increase of 42.5% (8,803 workers) in the number of professionals working with distance education compared to 2010 (5,055 professionals). With this increase in supply and demand for distance learning, behavior analysts have turned to the subject and investigated the practices of this type of education, that is, to investigate the ways in which researchers have directed their interests in order to contribute with elements for planning the future development of the area (Distance Education Census 2011).

Thereby, this study aimed to analyze a sample of the national scientific production of Behavior Analysis, selecting as a source of reference the annals of the Brazilian Association of Psychology and Behavioral Medicine (ABPMC). The chosen period was 2002-2012 (all years available on the website).

1. METHOD

1.1. Documents

The material used for the analysis of this study was publications in annals of meetings of the Association of Psychology and Behavioral Medicine (ABPMC) from 2002 to 2012. All documents are available online at the following address http://abpmc.org.br/site/anais/

1.2. Procedure

The selection of documents was carried out by searching for words in alphabetical order (CAPSI, Computer-aided, Computer Assisted Instruction, Computer-based Instruction, Computer-based Training, Computer-mediated, Computer-mediated Learning, Computer-programmed, Collaborative Learning, Cooperative Learning, Cyberspace, Distance Education, Distance Instruction, Distance Learning, Distance Teaching, Distance Education, Distance Education, Distance Learning, Computerized Education, E-learning, Education Scheduled, Hypermedia, Hypertext, Programmed Instruction, Instructional Design, Learning Communities, Learning Content Management System (LCMS), Learning Management System (LMS), Learning Platform (LP) mode Distance, Educational Mode Distance, Online, Online Teaching, Personalized System of Instruction, Proctors, education programming, PSI, system Custom Education, Education System Scheduled, Custom System for Teaching and Learning Technology). The search words containing hyphen were also used without the hyphen in the search.

It is considered to collecting and analyzing all the papers presented at any of the following formats: Oral Communication, Panel, Course, Lecture, First Steps, Round Table and / or coordinate Session and Symposium. The publications were selected in two stages: a pre-selection of documents and subsequently screened. After sorting, the reading was held the titles, abstracts and keywords for analysis (number of items, keywords, authors, participants, setting, purpose of the studies, target behavior, analyzed technology and procedures) of data. Not analyzed publications containing only the title without the abstract.

The works selected for analysis should meet two criteria of distance learning:

1) be mediation between teacher and student through information and communication technologies and 2) places and / or different times for the development of the activities of teacher and student as Decree No. 5622 (BRAZIL, 2005).

2. RESULTS

2.1. Number of publications

In the pre-selection of documents thirty seven publications were found, but only twelve met the criteria of distance proposed by Decree No. 5622 (BRAZIL, 2005), as shown in Table 1.

Table 1: Selected documents that met the search criteria

| YEAR	TYPE OF PRESENTATION	TITLE OF WORK
2004	Oral Communication	Online course in cognitive-behavioral therapy
2004	Oral Communication	*Student Study Strategies in a Distance-Learning Course Using an Artificially Intelligent Adaptive Instrucional System*
2004	Symposium	Effective education: conditions
2004	Symposium	*Behavior Analysis and Therapy On-Line at Southern Illinois University in the United States of America*
2005	Sessions	Just to Vary ... Why not apply behavioral principles to teach behavior analysis?
2009	Panel	Personalized Teaching System (PTS): possible contributions in different contexts
2011	Symposium	Teaching Reading and Mathematics: Behavior Analysis technology to those who learn and those who teach
2012	Oral Communication	PTS method fitness for Distance Education in Higher Education
2012	Oral Communication	Focusing on student learning - a PTS experience report
2012	Round Table	The teaching of behavior analysis of school training teachers in Distance Education - UFSCAR
2012	Round Table	The use of online resources in teaching and collaborative construction of teaching materials
2012	Round Table	Contributions of Behavior Analysis for the training of teachers in the distance mode

The cumulative number of publications classified as distance education found in the annals ABPMC is shown in Figure 1.
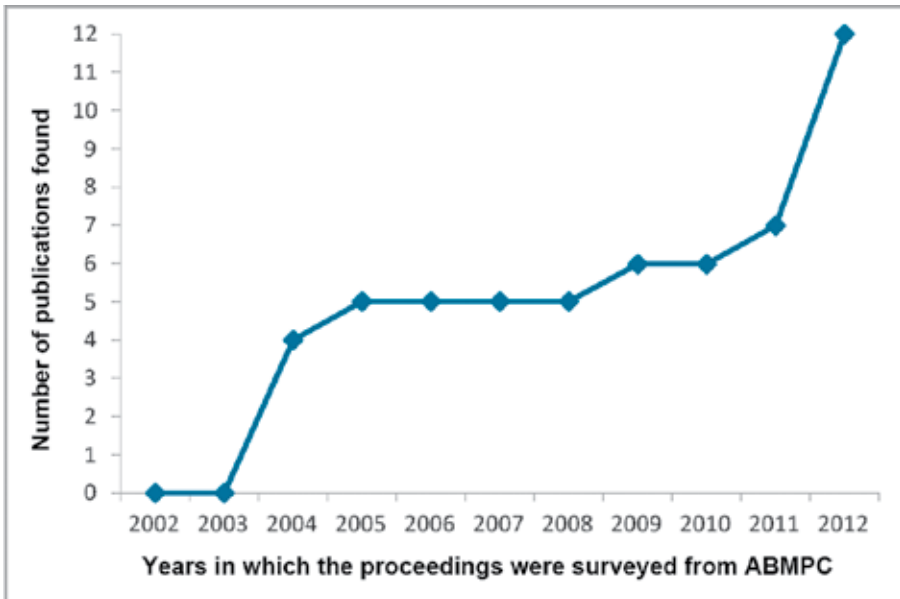
Figure 1: Cumulative number of publications found in the annals ABPMC that meet the criteria of Distance Education in the years surveyed in this article.

It can see that the publications about distance education began in 2004 and showed minimal growth over the years, taking a small step forward in 2012. It was unable to identify a year with a number of regular publications being 2004 (four publications, equivalent to 33.33% of the total publications) and 2012 (five publications, equivalent to 42.66% of the total publications) the years with a greater number of publications about distance education. In 2002, 2003, 2006, 2007, 2008 and 2010 there were no publications about the subject. The keywords that brought a greater number of publications can be viewed in Figure 2.

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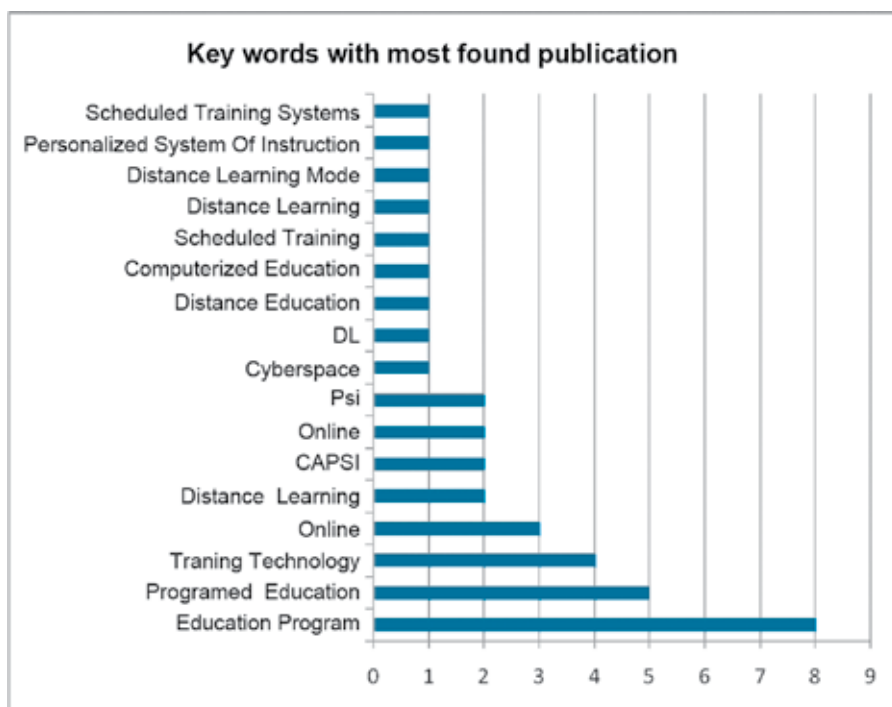
Figure 2: Number of publications found in the searched keywords that returned results.

2.2. Authors and affiliation

Compared to 41 keywords used in the search for publications about distance education, the keywords that brought a greater number in the group of thirty seven publications were: Teaching Programming (eight publications, equivalent to 21.62 %); Programmed instruction (with five publications, equivalent to 13.51%); Teaching technology (with four publications, equivalent to 10.81%); Online followed (with three publications, equivalent to 8.1%); CAPSI, Distance Learning, Online and PTS (two publications each, equivalent to 5.4% each); and other keywords appear once (2.7% each): Cyberspace, DE, Distance Education, Computerized Teaching, Teaching Scheduled, Distance-learning, Distance mode, Personalized System of Instruction and Education System Scheduled.

The twelve selected publications, a total of 26 authors and 11 participating institutions has been identified as some publications relied on the co-author of one or more authors. Of these 26 authors, only one author held three publications, equivalent to 25% of selected publications (one in 2005 and two in 2012), and the rest of the authors accounted for only one publication, leading to confirmation that few authors are experts in the field of distance education. However, it is worth emphasizing that these authors may have other publications in other journals and / or anal, since this study only considers publications in the ABPMC proceedings.

Two publications did not show the affiliation of the authors, containing only the title,

abstract, and the names of the authors, which prevented an analysis of the total number of institutions involved in the publications. Institutions that promoted more publications were the *Universidade Católica de Goiás*, UNB - IESB and *Universidade Federal de São Carlos* - UFSCar. All other institutions presented only one publication.

2.3. Participants

It was identified that studies on distance education did not show an equitable distribution with regard to the education level of

the participants involved in the polls because nine publications set their goals for higher education. When starting to analyze the content of each item amongst the 12 selected, it can check the types of participants that make up the studies. Much of the participants, ie 75%, are higher education students (they are mainly of psychology and pedagogy courses), supplemented by 16.7%, who are students of courses whose educational background are not specified in the summary and only one work, equivalent to 8.3%, in which the course is designed to virtual tutors (Figure 3).
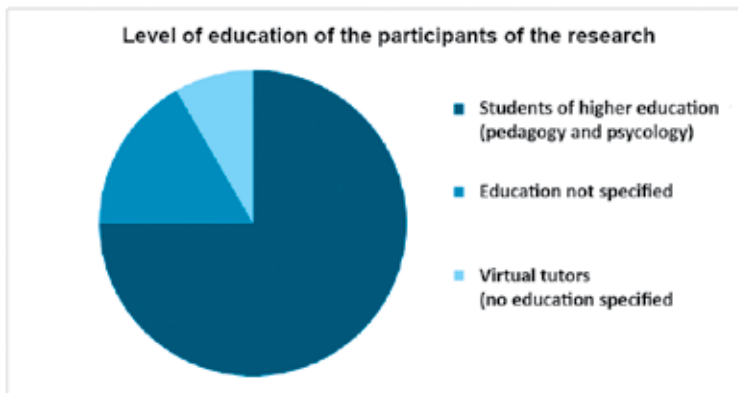
Figure 3: Level of education of the participants of the research selected in the study.

So you can see, in the selected studies, that the most participatory public of education through distance education in Brazil is generally of higher education students.

This data seems to corroborate with the study of Souza (2012), stating that most of the DE's students are older than 26 (68% of the students from this particular study claim to have 26 years old or more), which relates the age of being enrolled in higher education.

Despite the Decree No. 5622 (BRAZIL, 2005) state that the modality of distance education can be offered for all levels of education, publications analyzed in this study

showed a preference research on distance education aimed at the higher level.

2.4. Setting

Regarding to where the studies were carried out, 100% of the studies had as *setting* schools, and the vast majority of higher education institutions. Of the 12 selected studies, one makes it clear that the student might be carrying out activities inside or outside the campus of the institution, but other studies did not account for the summaries if the course was applied in their own head office or if students could choose to carry it out elsewhere too.

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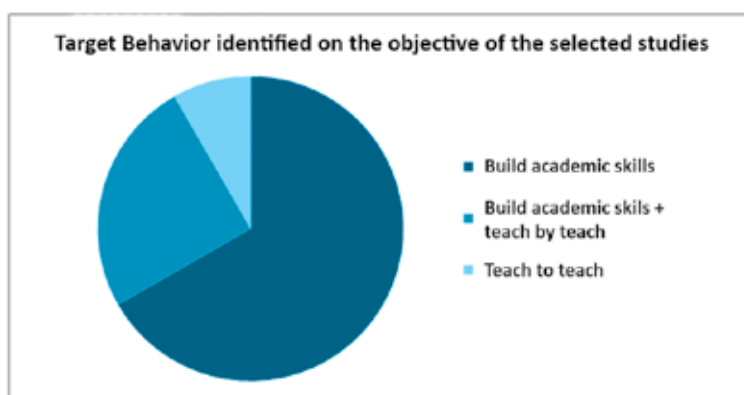
2.5. Studies objective

Regarding the objectives of the selected studies it was identified two major ways of rating, of which 66.7% seek to investigate the relationship between Custom Teaching System (*PTS*) proposed by Keller (1968), which seeks to put in practice the teachings of the Experimental Behavior Analysis in regard to the teaching/learning with the criteria and learning of distance education; and the remaining, equivalent to 33.3% of the studies, aimed to test online teaching procedures.

It is noticed that most studies aims to select and create learning strategies advocated by behavior analysts who study on the PSI with the modality of distance education, given that many common points can be observed between them. This result can be justified, given that the analyzed Proceedings are from the ABPMC event, where the vast majority of participants are behavior analysts and feature studies related to knowledge of this approach, explaining thus the reasons for the prevalence of these objectives in the articles found.

2.6. Target behavior

As regards the target behavior identified on the studies, they are divided into Develop academic skills and teaching the teach, as shown in Figure 4.

Figure 4: Target Behavior identified on the objective of the selected studies in this study.

The 66.7% target behavior studies is related to the development of academic skills, and in the remaining 25% are trying to develop an academic skill + teach to teach, and only 8.3% are intended only to Teach to teach. The prevalence of the target behaviors are related to academic skills can be justified given that all studies are in the school context, and especially in higher education institutions, making them understand the focus of teaching content through a discipline such as teaching math and reading, teaching Conditions of programming, disciplines related to knowledge of a specific approach to psychology or other science, among other contents.

In the category called Teach to Teach, were inclued the articles were aimed at training professionals working in distance education mode or the ones that understand the criteria of this form of education, being able to understand the teacher training, the conditions covered in this educational technology and the construction of textbooks related to that area. Articles classified as academic ability + Teaching teaching had as goals the two formations.

2.7. Used technology

Among the 12 selected articles, eight of them (66.7%) describes in his summary that the technology used refers to the computer, and the four remaining articles (33.3%) did not explain which was the technology used. Although four articles do not describe the technology used in their summaries, the probability that the computer has been used is quite large, in view of how the procedure has been reported.

The dominance of the computer under any other described technology meets what describes Vianney (2000), which, since the 90s, the spread of computer and Internet use by a larger audience come to contribute to the expansion of distance education in Brazil.

Adopted teaching procedures are presented in Figure 5.
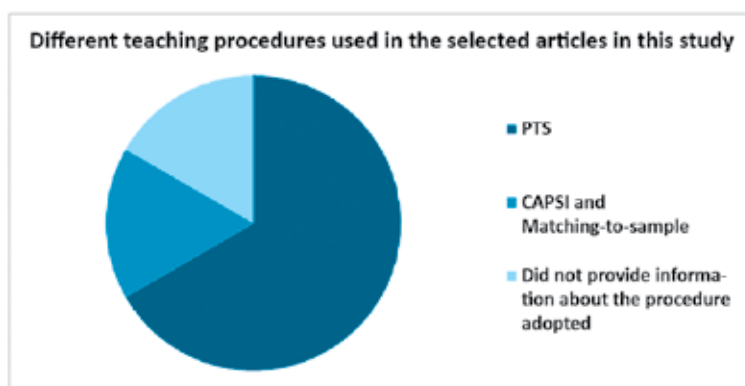
Figure 5: Different teaching procedures used in the selected articles in this study.

As shown in Figure 5, the use of different teaching procedures among the 12 selected articles showed the PTS in eight articles (66.66%) and CAPSI and Matching-to-sample in two articles (16.66%). The other two articles (16.66%) did not provide information about the procedure adopted in the summary of their research.

CONCLUSION

It is a fact that distance education has been established as a mode of education in our country and as well as many are the questions about how improvements effect it as a modality that contributes to the quality of education in Brazil. Although the distance education represents a growing development in our society, it was observed by the analysis of the respective work that there are quite few studies that aimed at understanding this phenomenon from the perspective of Behavior Analysis.

Clearly, the present study consider as search source only an association, and this becomes a limitation of this study. It is noticed that many of the selected works is related to content related to this approach being both in the field of behavior analysis or starting their teaching and learning concepts to relate it to the method of education at a distance.

However, the result achieved is relevant to the extent that the ABPMC is undoubtedly a representative institution of the research produced by behavior analysts today in this country. We realize also that the other results

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found, such as participants, setting, target behavior, technology used, among others, corroborate similar studies in the area in relation to what was found. It is important to note that the intention of this work is not done with it nor describe the incipient number of publications in Behavior Analysis on the topic nowadays, but waking up to this issue, including showing how this thought line psychology can contribute to the success of education in the distance mode.

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